

10/511557
DT04 Rec'd PCT/PTO 15 OCT 2004LISTING OF CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) A process for joining at least two substrates, ~~in particular~~ having electrical, semiconducting, mechanical and/or optical components, comprising the steps of:

providing a first substrate[,];

producing a joining element in the form of a frame on a first surface of the first substrate, the frame being made of a material selected from the group consisting of a binary system of materials, a glass, and or a vitreous material ~~being used as material for the frame, and the binary system of materials, the glass or the vitreous material being the material being applied by evaporation coating[,];~~

providing a second substrate[,]; and

joining the first and second substrates by ~~means of~~ the joining element.

2. (Currently amended) The process as claimed in claim 1, ~~in which wherein~~ the joining element is deposited on the first surface of the first substrate and is joined to the first substrate while it is being deposited.

3. (Currently amended) The process as claimed in ~~one of the preceding claims, in which claim 1, wherein~~ the joining element is applied to the first surface of the first substrate by evaporation coating.

4. (Cancelled)

5. (Currently amended) The process as claimed in ~~one of the preceding claims, in which claim 1, further comprising producing one or more supporting elements are produced inside the joining element on the first surface of the first substrate.~~

6. (Currently amended) The process as claimed in ~~one of the preceding claims, in which claim 1, further comprising applying a plurality of nested frames are applied by evaporation coating as the joining element.~~

7. (Currently amended) The process as claimed in ~~one of the preceding claims, in which claim 1, wherein the step of producing the joining element comprises deposition of a binary material system by evaporation coating.~~

8. (Currently amended) The process as claimed in ~~one of the preceding claims, in which claim 1, further comprising applying and structuring a glass layer is applied by evaporation coating and structured through a mask to form the joining element.~~

9. (Currently amended) The process as claimed in ~~one of the preceding claims, in which claim 1, further comprising structuring the joining element is structured by means of the a lift-off technique.~~

10. (Currently amended) The process as claimed in ~~one of the preceding claims, in which~~ claim 1, wherein the joining element and the second substrate are joined by a joint selected from the group consisting of an adhesively joined joint, a soldered joint, and or a bonded joint.

11. (Currently amended) The process as claimed in ~~one of the preceding claims, in which~~ claim 1, wherein the joining element and the second substrate are joined by ~~means~~ a joint selected from the group consisting of an anodic bonding, a fusion bonding, a sol-gel bonding, and a or low-temperature bonding.

12. (Currently amended) The process as claimed in ~~one of the preceding claims, in which~~ claim 1, wherein the first and second substrates comprise a first and second wafer, respectively, and wherein the process further comprises producing a multiplicity of laterally adjacent joining elements ~~are produced~~ on the first surface of the first wafer, and

after the first and second wafers have been joined to form a wafer assembly, dicing the wafer assembly ~~is dieed~~ into individual chips.

13. (Currently amended) The process as claimed in ~~one of the preceding claims, in which~~ claim 1, further comprising forming a cavity ~~is formed~~ between the first and second substrates and inside the frame.

14. (Currently amended) The process as claimed in ~~one of the preceding claims, in which claim 1, further comprising arranging interconnects are arranged on the first surface of the first substrate, and applying the joining element is applied to the first surface by evaporation coating in such a manner that the interconnects are at least partially covered.~~

15. (Currently amended) The process as claimed in ~~one of the preceding claims, in which claim 14, wherein the interconnects extend laterally or vertically through the joining element.~~

16. (Currently amended) The process as claimed in ~~one of the preceding claims, in which claim 1, further comprising planarizing the joining element is planarized after it has been produced on the first surface of the first substrate.~~

17. (Currently amended) The process as claimed in ~~one of the preceding claims, in which claim 1, further comprising producing alignment elements are produced on the first surface or a second surface of the first substrate, the second surface being on the opposite side from the first surface.~~

18. (Currently amended) The process as claimed in ~~one of the preceding claims, in which claim 1, further comprising joining a multiplicity of substrates are jointed to form a stack.~~

19. (Currently amended) A composite element, ~~in particular having electrical, electronic, semiconducting, mechanical and/or optical components, and in particular produced using the process as claimed in one of the preceding claims,~~ comprising:

a first substrate[,];

a joining element on a first surface of the first substrate, the joining element being a frame made from a material selected from the group consisting of a binary system of materials, a glass, and or a vitreous material, and the joining element being applied to the first surface of the first substrate by evaporation coating[,]; and

a second substrate, wherein the first and second substrates ~~being~~ are joined by means of the joining element.

20. (Currently amended) The composite element as claimed in claim 19, ~~in which wherein~~ the joining element is deposited on the first surface of the first substrate ~~and is joined to the first substrate.~~

21. (Currently amended) The composite element as claimed in ~~one of the preceding claims, in which~~ claim 19, further comprising one or more supporting elements ~~are~~ arranged on the first surface of the first substrate within the joining element.

22. (Currently amended) The composite element as claimed in ~~one of the preceding claims, which comprises~~ claim 19, further comprising a plurality of nested frames as the joining element.

23. (Currently amended) The composite element as claimed in ~~one of the preceding claims, in which~~ claim 19, wherein the joining element comprises a structured glass layer.

24. (Currently amended) The composite element as claimed in ~~one of the preceding claims, in which~~ claim 19, wherein the joining element is ~~structured and the structuring is a structuring produced by means of a lift-off technique~~ structured element.

25. (Currently amended) The composite element as claimed in ~~one of the preceding claims, in which~~ claim 19, wherein the joining element and the second substrate are joined to one another by a joint selected from the group consisting of an adhesively joined joint, a soldered joint, and or a bonded joint to one another.

26. (Currently amended) The composite element as claimed in ~~one of the preceding claims, in which~~ claim 19, wherein the joining element and the second substrate are joined to one another by a joint selected from the group consisting of and the joining is a join produced by means of an anodic bonding, a fusion bonding, a sol-gel bonding or, and a low-temperature bonding.

27. (Currently amended) The joining composite element as claimed in ~~one of the preceding claims, in which claim 19,~~ wherein the first and second substrates comprise a first and second wafer, respectively, and wherein the composite element further comprises a multiplicity of laterally adjacent joining elements are arranged on the first surface of the first wafer, and the multiplicity of laterally adjacent joining elements are being joined to a surface of the second substrate.

28. (Currently amended) The composite element as claimed in ~~one of the preceding claims, in which claim 19, further comprising~~ a cavity is formed between the first and second substrates and inside the frame.

29. (Currently amended) The composite element as claimed in claim 31, ~~in which~~ wherein the cavity is hermetically sealed.

30. (Currently amended) The composite element as claimed in ~~one of the preceding claims, in which claim 19, further comprising~~ interconnects which are at least partially covered by the joining element are arranged on the first surface of the first substrate.

31. (Currently amended) The composite element as claimed in ~~one of the preceding claims, in which claim 30, wherein~~ the interconnects extend laterally or vertically through the joining element.

32. (Currently amended) The composite element as claimed in ~~one of the preceding claims, in which~~ claim 19, wherein at least one surface of the joining element is planarized.

33. (Currently amended) The composite element as claimed in ~~one of the preceding claims, in which claim 19, further comprising~~ alignment elements are arranged on the first surface or a second surface of the first substrate, the second surface being on the opposite side from the first surface.

34. (Currently amended) An intermediate product for producing ~~the~~ a composite element as ~~claimed in one of the preceding claims, in particular~~ having electrical, electronic, semiconducting, mechanical and/or optical components, comprising:

a first substrate[,]; and

a joining element on a first surface of the first substrate, the joining element being a frame formed from a material selected from the group consisting of a binary system of materials, glass, and/or a vitreous material, and the joining element being applied to the first surface of the first substrate by evaporation coating, and wherein the joining element being designed in such a manner that the first substrate can be is adapted to joined the first substrate to a second substrate by means of the joining element.

35. (Cancelled)

36. (Cancelled)

37. (Currently amended) A process for joining substrates having electrical or optical components, ~~in particular as set forth in one of the preceding claims, in which comprising:~~

providing a first substrate and a second substrate are provided;

in a first step, applying a frame ~~is applied~~ to at least one surface of the first substrate, glass being used as material for the frame and the glass being applied by evaporation coating[[],]; and

in a second, subsequent step, joining or bonding a surface of the second substrate ~~is joined or bonded~~ to the frame[[],] so that a cavity ~~being~~ is formed between the first and second substrates and inside the frame.

38. (Currently amended) A composite element, ~~in particular having electrical or optical components on a substrate, in particular as set forth in one of the preceding claims,~~ comprising:

a first substrate and a second substrate[[],];

at least one frame ~~which~~ that has been applied to a surface of the first substrate, the at least one frame comprising a structured glass layer ~~which~~ that has been applied by evaporation coating[[],]; and

a joining region in which a surface of the at least one frame is joined or bonded to a surface of the second substrate[[],] so that a cavity ~~being~~ is formed between the first and second substrates inside the at least one frame.

39. (Currently amended) A process for joining at least two substrates, ~~in particular~~ having electrical, semiconducting, mechanical and/or optical components, comprising the steps of:

providing a first substrate [,] ;

producing a plurality of nested frame joining elements on a first surface of the first substrate[,] ;

providing a second substrate[,] ; and

joining the first and second substrates by ~~means of~~ the joining element, ~~a plurality of nested frames being produced as~~ the joining elements.

40. (Currently amended) A composite element, ~~in particular~~ having electrical, electronic, semiconducting, mechanical and/or optical components, ~~in particular produced by the process as set forth in one of the preceding claims,~~ comprising:

a first substrate[,] ;

a joining element on a first surface of the first substrate[,] ;

a second substrate, the first and second substrates being joined by ~~means of~~ the joining element[,] ; and

a plurality of nested frames being provided as the joining element.

41. (Cancelled)